SMPW Service General Description

MPW Workshop - ESTEC
June 17th, 2004
In our 20 years continuing commitment to give customers access to advanced technologies for Space Applications, Atmel is offering a new Space foundry service:

SMPW

(Space Multi Project Wafer)
SMPW Foundry Service Objectives

- A service for ANY European Space Customer
  - On the advanced 0.18µm RHA technology
  - With the ATC18RHA ASIC standard cell libraries

- Reduced manufacturing non recurring costs of ASIC development
  - By sharing reticules and silicon costs between several designs

- Same set of reticules for Prototyping and Flight Models

- In case of run overbooking, ESA will apply following priority criteria
  - 1 ESA mission ASICs
  - 2 ESA R&D ASICs
  - 3 non ESA commercial ASICs
  - 4 non ESA R&D ASICs
Generalities (1)

• No design constraints specific to SMPW
  - ATC18RHA design kit applies without restrictions
  - Each design is developed independently of the others
  - But new synchronization milestones are created

• SMPW is a Space foundry service
  - The SMPW is limited to reticules and wafers manufacturing
  - 1 sole reticules set for all the designs embarked
  - Several designs manufactured on the same wafer
  - Wafers split in sub-lots assigned to 1 design
SMPW runs will be launched at fix dates made public in advance to the space community.

Each run includes:
- Reticules manufacturing
- 1 lot with priority for prototyping

Complementary lots for Flight Models can be launched:
- With the same reticules
- Without date restriction
- When needs appear

ESA reserved and funded 4 runs dedicated to ESA projects:
- Nevertheless, if surface available on the reticule, non ESA projects could embark on an ESA dedicated run,
  - after ESA approval
Generalities (3)

- 2 majors milestones dedicated to SMPW management are created

  - Logic Review Closing Date (LRCD)
    - Fix date
    - Firm approval from ESA to what designs are on the run
    - Firm confirmation from Atmel to embark the design
    - Firm confirmation from customer to embark and meet the schedule of the SMPW
    - From this date, cancellation charges apply

  - Design Review Closing Date (DRCD)
    - Fix date
    - Start of the foundry manufacturing
Wafers assignment

• Prototyping
  ➢ The first lot of 25 wafers will produce in priority prototypes

• Flight Models
  ➢ Can be manufactured with the remaining wafers of the first lot (if any)
  ➢ If not, launch of a new lot with the same reticule
SMPW Definition and Validation

• Definition and Validation of the SMPW in the frame of an ESA contract

➢ Atmel led an engineering activity to adapt the existing mono project procedures to the SMPW

➢ Objectives and constraints
  ▪ Reduce customers’ foundry costs
  ▪ No negative impact from one customer design on the others
  ▪ Secure the space quality
  ▪ Processes have to be as close as possible of the current space manufacturing flow
  ▪ Produce the maximum quantity of parts despite the limitations of equipments
SMPW Definition and Validation

- Technical constraints are impacting mostly the organization of the designs on the reticule
- No technical modifications in the process of the wafer
- But, the spare areas between the designs will be filled with “dummy structures”
- No technical modifications in the probe and assembly processes
- But, management rules have been added allowing to treat each wafer sub lot as a mono-project wafer
SMPW Definition and Validation

- Verification with a so-called “Validation Run”
  - Reticule using SMPW organization rules
  - Production of an engineering wafers lot (prototypes)
  - Verification of the complementary management rules introduced in probe and assembly areas
SMPW Definition and Validation

• Designs embarked on the “Validation Run”
  ➢ 4 designs on 3 different matrix sizes
    ▪ 1 design on the largest matrix (170 mm²)
    ▪ 1 design on the second largest matrix (114 mm²)
    ▪ 2 designs on the intermediate matrix (74 mm²)

• “Validation Run” schedule
  ➢ Design Review Closing Date (DRCD) Mid July 2004
  ➢ Prototype assy and test November 2004
  ➢ Final Validation Run conclusions December 2004
SMPW more information

- Atmel website (www.atmel.com) will indicate
  - The MPW runs dates
  - The free remaining area on the reticule per run

- Direct link

- Contact point
  - Valérie Ho-Shui-Ling
    Valerie.ho-shui-ling@nto.atmel.com
    +33 2 40 18 17 83